



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/009,530	01/22/2002	Trevor Martin	124-909	4032

7590

07/02/2003

Nixon & Vanderhye  
8th Floor  
1100 North Glebe Road  
Arlington, VA 22201-4714

EXAMINER

ANDERSON, MATTHEW A

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 07/02/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/009,530

Applicant(s)

MARTIN ET AL.

Examiner

Matthew A. Anderson

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claim 1 ,2, 4, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodhue (US 4855255) in further view of Moerman (IEEE Journal of Selected Topics in Quantum Electronics, 3(6), pp. 1308-1320, December 1997.)\

Goodhue discloses tapered laser or waveguide devices made by gradient thermal heating during epitaxial growth of III-V semiconductors such as GaAs and AlGaAs (see abstract). Fig. 9 details an example with MPE (molecular beam epitaxy). CBE (chemical beam epitaxy) is disclosed in col. 10 lines 50-53 as an alternative method of deposition.

Goodhue does not disclose the use of a mechanical mask to form the tapered layer.

Moerman et al. discloses the known fabrication technology used to form tapers in III-V semiconductor devices. Fig. 7 and the last paragraph in col. 1 describe the mechanical shadow masked growth technique by which an easily removable monocrystalline Si mask is placed over the substrate and both tapered and un-tapered layers are grown in a single step (see especially Fig. 7 (f) ).

It would have been obvious to one of ordinary skill in the art at the time of the present invention to combine the descriptions of Goodhue and Moerman because Moerman describes the mechanical mask as easily removed after the growth thus simplifying the process.

It would have been obvious to one of ordinary skill in the art at the time of the present invention to grow a tapered epitaxial layer by CBE upon a substrate by using a mechanical shadow mask because such is suggested by the combined disclosures above.

Art Unit: 1765

It would have been obvious to one of ordinary skill in the art at the time of the present invention to grow both tapered and un-tapered portions of the epitaxial layer because such is clearly suggested by Fig. 7(f) of Moerman et al..

In respect to claims 4,5, it would have been obvious to one of ordinary skill in the art at the time of the present invention to fabricate a waveguide device in the manner claimed because such is suggested by Moerman in the abstract .

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goodhue and Moerman et al. as applied to claims 1,2,4,5 above, and further in view of Colas et al. (Applied Physics Letters, 59(16), pp. 2019-2021, 14 October 1991.).

Goodhue and Moerman et al. are described above.

This combination does not explicitly describe the mechanical shadow mask as having a oxide film coating on which deposition is retarded at the process conditions.

Colas et al. discloses that it was known to effect the local growth rate by choosing the pattern of dielectric (e.g. SiO<sub>2</sub>) masked layers during selective area growth of III-V semiconductors.

It would have been obvious to one of ordinary skill in the art at the time of the present invention to combine the oxide layer because this would prevent contamination from superfluous deposited material on the mask.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the present invention to use etched Si wafers (as per Moerman et al;.) with an oxide mask to prevent deposition on the mask.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew A. Anderson whose telephone number is (703) 308-0086. The examiner can normally be reached on M-Th, 6:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

MAA  
June 28, 2003

*Matthew Anderson*  
*AU. 1765*